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IRIS PIGMENTATION AND NORMAL CONTRAST SENSITIVITY  
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(Chairman: Prof. I. Scullica)

**Purpose:** Iris pigmentation is known to be correlated with ocular pigmentation and is believed to be of predictive value for visual function loss in age-related macular degeneration. The aim of this study was to evaluate the relationship between contrast sensitivity (CS) and iris pigmentation in normal subjects.

**Methods:** Static CS at different spatial frequencies (SF, 1.5-18 c/deg, Vistech CS 1000) was measured in 36 subjects free of ocular or systemic diseases. Fourteen subjects (mean age: 39, range: 19 - 65) had light irides (LI, grade I and II, standard A and B), while 24 (mean age: 43, range: 13 - 70) had dark irides (DI, grade III - V, standard C and D), according to the staging scheme of Seddow et al. (1990). Pupils were natural during testing and their size did not differ between the two subject groups.

**Results:** At low SF's (1.5 - 3.0 c/deg), LI subjects showed significantly greater CS values ( $p < 0.01$ ) compared to DI subjects. The average differences were of 2.25 dB at both 1.5 and 3.0 c/deg. At higher spatial frequencies (6.0 - 18.0 c/deg) there were no significant differences between the groups. The amount of low spatial frequency attenuation (peak-to-low spatial frequency ratio) was larger in DI compared to LI subjects.

**Conclusions:** The results indicate an SF selective change in CS as a function of iris pigmentation in normal subjects and suggest changes in neuronal density and/or neurotransmitter properties of subpopulations of visual cells, associated with ocular pigmentation.

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ASSESSMENT OF THE NORMAL RANGES OF THE DESATURATED  
ROTH 28 HUE COLOR TEST SCORESERB C., ADLER M., STÜBGER N., WOHLRAB M., THIEL H.-J.  
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**Purpose:** In the detection of color vision deficiencies, the focus is not only on the disturbed color axis, but also on the degree of disturbed color vision. Therefore, in order to find out the normal sum of errors, we evaluated this color test in a normal population.

**Methods:** 95 subjects (m:f=71:24) without any ocular or general chronic disease were tested monocularly with the desaturated Roth 28 HUE color test (Luneau, Paris) under standard conditions. The background was a black cardboard, the illumination consisted of two fluorescent lamps (Osram L18W/11, Germany) with 6000 Kelvin. The subjects were divided into 4 different age groups: 0-19, 20-39, 40-59 and 60-79. The quantitative analysis was done using a specially developed software (M.A.) on an IBM compatible computer.

**Results:** In the ophthalmic examination, no functional or morphological abnormalities were found. In general, the mean sum of errors was  $66 \pm 35$  (Minimum 0, Maximum 174; Median 60). There were no differences between the right or left eye ( $p=0.6$ , Mann-Whitney test), nor between male and female ( $p=0.64$ , Mann-Whitney test). No correlation was found between age and sum of errors (regression coefficient = -0.027;  $p=0.94$ ).

**Conclusion:** Based on these data, the desaturated Roth 28 HUE test seems to be a color test with a stable sum of errors over the age. Therefore, this test can now be used in the follow-up of color disturbances, caused for example by chronic drug application or by chronic diseases. In addition, this test is quicker than the Farnsworth Munsell 100 HUE test and therefore less dependent of the patient's vigilance.

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## Measuring time delays in colour vision using the Pulfrich effect.

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In this study we use the Pulfrich effect to measure the ordered delay in transmission and processing in the colour sub-system of human vision. We overcome a number of technical difficulties implicit in such a study by using an drifting equiluminant grating on a cathodode tube monitor to replace the pendulum bob thus increasing annotation as well as ensuring constant disparity and removing edge artefacts. The gratings can be viewed as either an illusory or real motion of either the test or the "Anchored" colour and vary in the rate of temporal frequency. Inter-view colour synchrony or asynchrony of "time delay" ellipses are used to display the delay in a form analogous to Michelson ellipses.

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DETERMINATION OF COLOURED SATURATION THRESHOLD  
USING GEPCO : COMPARED DATA OF CONTROL SUBJECTS  
AND DIABETICS WITHOUT RETINOPATHY.

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CHU Tours (France).**Purpose :**

Evaluation of the coloured saturation threshold of Lanthony using a new high performance on TV screen.

**Methods :**

The stimulation is performed on a high performance TV monitor driven by a computer program (CNAM - Paris - Pr Vu Thien).

The test is of 3° angular size at the observation distance of 1,5 m. It consists of two areas :

- one white area with fixed photopic luminance ( $42 \text{ cd/m}^2$ ) and with colorimetric purity equal zero ; it is the reference with which are compared,
- the other area with a same fixed photopic luminance and with variable tonality and colorimetric purity.

Six chrominances are studied : 500 nm (green), 500 nm (purple), 490 nm (cyan), 650 nm (red), 460 nm (blue) and 570 nm (yellow).

The examined subject modifies, with the help of a joy stick, the colorimetric purity until perception of a difference between the 2 areas. This determines the coloured saturation threshold.

**Results :**

we include 124 control subjects distributed in 4 age brackets. We report the results with the average curves and standard observations for each of the six studied chrominances. We compare this results with those of diabetics subjects.

**Conclusions :**

This test seems to be reliable to explore green, red, cyan, purple, with an acceptable standard deviation.

But for blue and yellow the standard deviation is very high for all ages. So its use to detect glaucomatous suffering at the beginning is not enough.